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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,603	02/12/2004	Donald J. Curry	117747	3952

27074 7590 04/03/2007

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EXAMINER	
SHIKHMAN, MAX	
ART UNIT	**PAPER NUMBER**
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/03/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/03/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/776,603	CURRY ET AL.	
	Examiner	Art Unit	
	Max Shikhman	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-21* is/are rejected.

7)☒ Claim(s) *12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02/12/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/12/2004. 10/05/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: Page 1, line2, "*attorney docket numbers (117521, 117544, 117745, 117746, 117748, 118584, 118591, 118601 and 118664)*" should be replaced with application numbers or patent numbers. Appropriate correction is required.

Claim Objections

2. **Claims 13-18** are objected to because of the following informalities: In Claim 13, "*critical of portions*" should be changed to –critical portions–. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 3** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 needs to clarify if its two operations, averaging and setting, are done "*in pixel neighborhoods*" of claim 2, or across the entire image.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 1-11, 13-21** are rejected under 35 U.S.C. 102(b) as being anticipated by Ricardo L. de Queiroz, COMPRESSION OF COMPOUND DOCUMENTS (Xerox Corporation 800 Phillips Rd., 128-273, Webster, NY, 14580) (IDS). Queiroz discloses as follows.

() **Regarding Claim 1**:

A method for processing an image comprising: identifying pixels in the image which are less critical; and substituting data into identified pixels, the data being chosen to provide a desired characteristic for processing the image.

(Page 210, column 2, "Since each layer (FG or BG) may contain unused pixels (since the pixels in that position will be selected from the other layer), those can be replaced by any color in order to enhance compression.")

() **Regarding Claim 2**:

The method of claim 1, further comprising: generating a hole-image by setting to zero pixel values of pixels identified to be less critical to the image;

(Page 210, column 2, "Since each layer (FG or BG) may contain unused pixels (since the pixels in that position will be selected from the other layer), those can be replaced by any color in order to enhance compression." "any color" includes black color, which is zero valued.
Page 210-211, "By inspecting the binary mask, it labels the input block pixels as useful (U) or "don't care" (X). The X-marked pixels can be replaced by anything else since they are not going to be used for decompression.")

and sub-sampling the hole-image, by averaging non-zero pixel values in pixel neighborhoods to obtain sub-sampled pixel values for the sub-sampled hole-image.
(Page 211, "If there are 64 X-marked pixels, the block is unused and we output a flat-block whose pixels have the average of the previous block. If there is a mix of U- and X-marked pixels, we follow a multi-pass algorithm: in each pass, pixels marked "X" who have at least one U-marked horizontal or vertical neighbour is replaced by the average of those neighbours and marked "U" for the next pass.")

() **Regarding Claim 3**:

averaging non-zero sub-sampled pixel values of the sub-sampled hole-image to obtain an average value; setting sub-sampled pixel values of zero to the average value of the non-zero sub-sampled pixel values.
(Page 211, column 1, "If there is a mix of U- and X-marked pixels, we follow a multi-pass algorithm: in each pass, pixels marked "X" who have at least one U-marked horizontal or vertical neighbour is replaced by the average of those neighbours and marked "U" for the next pass.")

() **Regarding Claim 4**:

The method of claim 1, wherein the desired characteristic is at least one of a compression characteristic and a processing speed.

(Page 210, column 2, "Since each layer (FG or BG) may contain unused pixels (since the pixels in that position will be selected from the other layer), those can be replaced by any color in order to enhance compression. This is the function of the preprocessor."

Page 211, column 1, "Given the preprocessor just described, our goal is to find the best mapping (input block to Mask block) which will optimize compression in a rate-distortion (RD) sense. Rate is given in bits necessary to encode all 3 layers.")

() **Regarding Claim 5**:

The method of claim 1, wherein the substituted data is an average of data values of the non-identified pixels.

(Page 211, column 1, "If there is a mix of U- and X-marked pixels, we follow a multi-pass algorithm: in each pass, pixels marked "X" who have at least one U-marked horizontal or vertical neighbour is replaced by the average of those neighbours and marked "U" for the next pass.")

() **Regarding Claim 6**:

A method for processing an image to form a background plane and N-binary foreground planes, comprising: inserting zeroes into pixel data for pixels in the background plane corresponding to areas which have been placed into one of the N-binary foreground planes, to generate a hole-image;

(Page 210, column 2, "Since each layer (FG or BG) may contain unused pixels (since the pixels in that position will be selected from the other layer), those can be replaced by any color in order to enhance compression." "any color" includes black color, which is zero valued.

Page 210-211, "By inspecting the binary mask, it labels the input block pixels as useful (U) or "don't care" (X). The X-marked pixels can be replaced by anything else since they are not going to be used for decompression.")

sub-sampling the hole-image to obtain one or more blocks of sub-sampled pixel values, each of the sub-sampled pixel values having a non-zero value if a corresponding neighborhood has at least one non-zero pixel value, or a zero value if the corresponding neighborhood has all zero pixel values;

(Page 211, "If there are 64 X-marked pixels, the block is unused and we output a flat-block whose pixels have the average of the previous block. If there is a mix of U- and X-marked pixels, we follow a multi-pass algorithm: in each pass, pixels marked "X" who have at least one U-marked horizontal or vertical neighbour is replaced by the average of those neighbours and marked "U" for the next pass."

Page 211, column 1, "The image block is also sub-sampled...")

averaging color values of non-zero sub-sampled pixel values in each of the blocks to obtain a block average color value for each of the blocks; and substituting sub-sampled pixel values of each of the blocks that are equal to zero to the block average color value of each of the blocks.

(Page 211, "If there are 64 X-marked pixels, the block is unused and we output a flat-block whose pixels have the average of the previous block. If there is a mix of U- and X-marked pixels, we follow a multi-pass algorithm: in each pass, pixels marked "X" who have at least one U-marked horizontal or vertical neighbour is replaced by the average of those neighbours and marked "U" for the next pass.")

() **Regarding Claim 7**:

The method of claim 6, further comprising: identifying a previous block based on a predetermined criterion; and substituting an average color value of the previous block for sub-sampled pixel values in a block in which all of the sub-sampled pixel values are zero.
(Page 211, "If there are 64 X-marked pixels, the block is unused and we output a flat-block whose pixels have the average of the previous block.)

() **Regarding Claim 8**:

The method of claim 7, wherein the previous block is the previous block as defined by the JPEG order of blocks within a minimum coded unit.
(Page 210, column 2, "assume layers have same dimensions, and the encoder for FG and BG layers is JPEG. For each 8x8 input pixel block the preprocessor receives a block of equal dimensions of binary data."
Page 210-211, "By inspecting the binary mask, it labels the input block pixels as useful (U) or "don't care" (X). The X-marked pixels can be replaced by anything else since they are not going to be used for decompression." "any color" includes black color, which is zero valued.
Page 211, column 1, "because of JPEG's DC DPCM".)

() **Regarding Claim 9**:

The method of claim 6, further comprising one or more of: adjusting the image according to predefined requirements; and

setting a chroma value of a pixel to a midpoint in its allowed range when a luminance value of the pixel is at a maximum of its allowed range.
("*one or more*" allows Examiner to select only "*adjusting the image according to predefined requirements;*".

Page 210, column 2, "Since each layer (FG or BG) may contain unused pixels (since the pixels in that position will be selected from the other layer), those can be replaced by any color in order to enhance compression." "any color" includes black color, which is zero valued.
Page 210-211, "By inspecting the binary mask, it labels the input block pixels as useful (U) or "don't care" (X). The X-marked pixels can be replaced by anything else since they are not going to be used for decompression.")

() **Regarding Claim 10**:

The method of claim 6, wherein sub-sampling the hole-image comprises: averaging one or more pixel values within a neighborhood of pixels to obtain a sub-sampled pixel value that corresponds to the neighborhood.

(Page 211, "If there is a mix of U- and X-marked pixels, we follow a multi-pass algorithm: in each pass, pixels marked "X" who have at least one U-marked horizontal or vertical neighbour is replaced by the average of those neighbours and marked "U" for the next pass."
Page 211, column 1, "The image block is also sub-sampled...")

() **Regarding Claim 11**:

The method of claim 10, wherein averaging the pixel values comprises: summing the pixel values within the neighborhood of pixels; and dividing the sum of pixel values by a number of non-zero pixels, to obtain the sub-sampled pixel value.

(Page 211, "If there is a mix of U- and X-marked pixels, we follow a multi-pass algorithm: in each pass, pixels marked "X" who have at least one U-marked horizontal or vertical neighbour is replaced by the average of those neighbours and marked "U" for the next pass."
Page 211, column 1, "The image block is also sub-sampled...")

() **Regarding Claim 13**:

An apparatus that processes an image, comprising: a memory that stores image data and selector data, wherein the selector data identifies less critical of portions of the image data; and a processor that sets less critical portions of the image data to desired values based on the selector data.

(Page 210, column 2, "For the storage, archiving and general interchange of MRC-encoded image data, the TIFF-FX file format has been proposed."

"Since each layer (FG or BG) may contain unused pixels (since the pixels in that position will be selected from the other layer), those can be replaced by any color in order to enhance compression." "any color" includes black color, which is zero valued.

Page 210-211, "By inspecting the binary mask, it labels the input block pixels as useful (U) or "don't care" (X). The X-marked pixels can be replaced by anything else since they are not going to be used for decompression."

Page 210, column 2, "Since each layer (FG or BG) may contain unused pixels (since the pixels in that position will be selected from the other layer), those can be replaced by any color in order to enhance compression. This is the function of the preprocessor. The overall diagram is illustrated in Fig. 3.")

() **Regarding Claim 14**:

The apparatus of claim 13, wherein the processor sets the less critical portions of the image data to zero, to generate hole-image data.

(Page 210, column 2, "Since each layer (FG or BG) may contain unused pixels (since the pixels in that position will be selected from the other layer), those can be replaced by any color in order

to enhance compression. This is the function of the preprocessor. The overall diagram is illustrated in Fig. 3." "any color" includes black color, which is zero valued.)

() **Regarding Claim 15**:

The apparatus of claim 14, further comprising: a sub-sampling processor that sub-samples the hole-image data and averages the non-zero data values in a block of the sub-sampled hole-image data to obtain a block average value; a pixel substitutor which substitutes the block average value of the non-zero data values for the zero values in the sub-sampled hole-image data.

(Page 211, column 1, "The block-wise pre-processor we used in this paper works as follows. If there are 64 X-marked pixels, the block is unused and we output a flat-block whose pixels have the average of the previous block. If there is a mix of U- and X-marked pixels, we follow a multi-pass algorithm: in each pass, pixels marked "X" who have at least one U-marked horizontal or vertical neighbour is replaced by the average of those neighbours and marked "U" for the next pass. The process is continued until there are no X-marked pels left in the block. The aim of the algorithm is to replace the unused parts of a block with data that will produce a smooth block.")

() **Regarding Claim 16**:

The apparatus of claim 15, wherein the sub-sampling processor sub-samples the hole-image data by setting the sub-sample pixels to values equal to an average of the non-zero pixels in contiguous, non-overlapping pixel neighborhoods.

(Page 210, column 1, "For each 8x8 input pixel block the preprocessor receives a block of equal dimensions of binary data."

Page 211, column 1, "The block-wise pre-processor we used in this paper works as

follows. If there are 64 X-marked pixels, the block is unused and we output a flat-block whose pixels have the average of the previous block. If there is a mix of U- and X-marked pixels, we follow a multi-pass algorithm: in each pass, pixels marked "X" who have at least one U-marked horizontal or vertical neighbour is replaced by the average of those neighbours and marked "U" for the next pass. The process is continued until there are no X-marked pels left in the block. The aim of the algorithm is to replace the unused parts of a block with data that will produce a smooth block.")

() **Regarding Claim 17**:

a hole-filler that identifies previous blocks based on predefined criteria, and replaces zero values of the blocks of sub-sampled hole-image data with a previous block average value, when the blocks of sub-sampled hole-image data consist entirely of zeroes.

(Page 210-211, "By inspecting the binary mask, it labels the input block pixels as useful (U) or "don't care" (X). The X-marked pixels can be replaced by anything else since they are not going to be used for decompression." "any color" includes black color, which is zero valued.

Page 211, column 1, "The block-wise pre-processor we used in this paper works as follows. If there are 64 X-marked pixels, the block is unused and we output a flat-block whose pixels have the average of the previous block.)

() **Regarding Claim 18**:

The apparatus of claim 17, wherein the previous block is the previous block as defined by the JPEG order of blocks within a minimum coded unit.

(Page 210, column 2, "assume layers have same dimensions, and the encoder for FG and BG layers is JPEG. For each 8x8 input pixel block the preprocessor receives a block of equal dimensions of binary data."

Page 210-211, "By inspecting the binary mask, it labels the input block pixels as useful (U) or "don't care" (X). The X-marked pixels can be replaced by anything else since they are not going to be used for decompression." "any color" includes black color, which is zero valued.

Page 211, column 1, "because of JPEG's DC DPCM".)

() **Regarding Claim 19**:

A computer-readable medium having computer-readable program code embodied therein, the computer-readable program code performing the method of claim 1.

(Page 210, column 2, "The compression algorithm and resolution used for a given layer would be matched to the layer's content, allowing for improved compression while reducing distortion visibility. The compressed layers are then packaged in a format, such as TIFF-FX [21] or as an ITUT MRC [19] data stream for delivery to the decoder. At the decoder, each plane is retrieved, decompressed, processed (which might include scaling) and the image is composed using the MRC imaging model.

MRC was originally approved for use in Group 3 color fax and is described in ITU-T Recommendation T.44. For the storage, archiving and general interchange of MRC-encoded image data, the TIFF-FX file format has been proposed.")

() **Regarding Claim 20**:

A xerographic marking device using the method of claim 1.

(Page 210, column 2, "MRC was originally approved for use in Group 3 color fax and is described in ITU-T Recommendation T.44.")

() **Regarding Claim 21**:

A digital photocopier using the method of claim 1.

(Page 210, column 2, "MRC was originally approved for use in Group 3 color fax and is described in ITU-T Recommendation T.44.")

Allowable Subject Matter

7. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for allowable subject matter. Claim 12 would be allowable because the prior art does not disclose, "*the neighborhood of pixels is a 2x2 neighborhood for luminance data, and a 4x4 neighborhood for chroma data.*"

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. MacLeod (US-PAT-NO: 5778092) discloses, "Method and apparatus for compressing color or gray scale documents."

Debargha Mukherjee, Christos Chrysafis, and Amir Said disclose, "JPEG2000-Matched MRC compression of compound documents," Proc. IEEE Int. Conf. Image Processing, vol. 3, pp. 73-76, Sept. 2002. (PDF)

10 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Max Shikhman whose telephone number is (571) 270-1669. The examiner can normally be reached on Monday-Friday 7:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Max Shikhman

3/12/2007

Shuwang Liu

SHUWANG LIU
SUPERVISORY PATENT EXAMINER